of a temperature of 35° C., 4.672 grammes of dry starch into sugar; as 1 gramme of fresh juice contains 0.014 grammes of pancreatic ferment, one gramme of this ferment would transform 333.7 grammes of dry starch. If we assume, with Frerichs, that an adult man requires daily about 490 grammes (=15 ounces nearly) of starch to compensate the daily loss of carbon, the quantity of pancreatic juice necessary for the transformation of this starch into sugar would be less than 105 grammes, while the quantity actually secreted amounts to more than 5000 grammes. Kroeger is therefore of the same opinion with Bidder and Schmidt—viz: that the pancreatic juice cannot have as its *principal* function the transformation of starch into sugar. As one of the functions, he considers the promotion of the constant interchange of fluids within the body, in the same manner as Bidder and Schmidt have made it so probable concerning the saliva, and with Grunewald and Schroeder concerning the gastric juice. It further appears to him that an intimate connection exists between the secretion of the stomach and that of the pancreas—namely, that the hydrochloric acid secreted by the former is, after having performed its part, neutralized by the soda of the latter, thus again forming the chloride of sodium previously disunited by the process of secretion. In favour of this theory Kroeger observes that the hydrochloric acid secreted by 1 kilogramme of dog through the gastric juice in twenty-four hours amounts to 0.305 grammes, while that of soda contained in the pancreatic juice of twenty-four hours is calculated at 0.237 grammes, *i. e.*, very nearly the equivalent (0.259) corresponding to 0.305 grammes of hydrochloric acid.—*Ibid.*

MATERIA MEDICA AND PHARMACY.

10. *On Digitaline.*—Prof. Christison states (*Monthly Journal of Medicine*, January, 1855) that his experience of the effects of digitaline has been highly satisfactory. I have, he says, used it expressly as a diuretic only; but its sedative virtues have also come incidentally under observation; and it is quite evident that digitaline is a most energetic remedy in both ways.

In the first two trials made with it, which were both of them in cases of extensive, protracted, obstinate œdema in connection with disease of the kidneys, diuresis commenced, in one towards the close of the second day, and in the other a day later; in both the flow of urine was profuse: and in both the œdema entirely disappeared, but with the slowness not uncommonly observed in this form of dropsy.

Here I cannot help observing in passing, that a striking illustration was presented, on both these occasions, of the unsoundness of the objection which has been brought by many practitioners, since it was first propounded by Dr. Osborne, against the use of diuretics in the renal forms of dropsy. I have taken every opportunity, in my clinical lectures, and in occasional publications, to protest equally against the unsoundness of the theory and the looseness of the facts, which have led to the prohibition of diuretics in renal dropsy, and which have deprived many persons of the most immediate and most efficacious means of relief from the principal secondary affection occurring in Bright's disease of the kidneys. And I may here repeat, in the strongest terms, that I have never, except in a single instance, seen the albuminosity of the urine, or any other indications—which either the other conditions of the urine or any other local symptoms can furnish—increased under the employment of such diuretics as I have given in this disease. These are digitalis, squill, and bitartrate of potash, sometimes singly, more commonly combined. What may be the case with other diuretics I shall not pretend to decide. I strongly suspect that they are all in the same category, and that they have been shunned on grounds purely theoretical and baseless. But at any rate I can answer for the theory not holding in the case of the three diuretics I have mentioned. So, too, in the case of digitaline. It is not a little remarkable that in the first two patients to whom

I administered it, the albumen, instead of being increased, was quickly and greatly diminished. In one it disappeared entirely in a few days, and did not return so long as the patient remained under observation in convalescence. In the other it also disappeared: but after some days the albumen reappeared, though in a greatly diminished proportion. Digitaline, therefore, while it stimulates the kidneys to increased secretion, has not, in so doing, any effect, as some have thought of digitalis and diuretics at large, in increasing the peculiar renal irritation which constitutes or occasions Bright's disease.

Digitaline has proved equally, or even more serviceable in dropsy connected with disease of the heart. It has, in my hands, accomplished complete discharge of the dropsical effusions, and thus effected such relief as to enable the patient to return to his occupations, though given in circumstances apparently very desperate. In this respect digitaline has done no more than is often accomplished by foxglove itself. But it has appeared to me to act with more speed, and with greater force after the action did begin. In one instance great depression of the heart's action was brought on instead of a flow of urine.

I have also given it in some local dropsies, more especially ascites, either simple or combined with anasarca of the lower part of the body only. It has not proved more useful, however, as a diuretic in these cases than digitalis and other diuretics; which in general fail to influence the urine or remove the dropsical effusion, when given internally. I have not yet tried it externally, according to the method recommended by me with infusion of foxglove.[1]

There can be no doubt that digitaline possesses the action of foxglove itself upon the heart and circulation. I have not made express trial of this action. But while using it to excite diuresis in a case of dropsy with diseased heart, the pulse began to flag, soon fell to 44, and became very soft and somewhat irregular. At the same time languor, nausea in a slight degree, and faintness ensued. All these symptoms disappeared in a few days after the remedy was discontinued. On this occasion I observed that the two actions of digitaline, its diuretic and sedative actions, do not concur. It is very likely that they are even incompatible. This I have formerly stated to be a probable fact in regard to the actions of foxglove.[2] The disregard of it is, I apprehend, the reason why some underrate the efficacy of foxglove as a diuretic. Attention should therefore be paid to the fact in using digitaline.

The dose to be administered is stated by MM. Homolle and Quevenne at a seventy-fifth part of a grain of digitaline, three times a day. I have never given any other dose. It is a very small one certainly. But a tenth of a grain will kill a little dog; so that the dose is only in proportion to its exceeding energy. The form I have used is that of a pill about a grain in weight. It is to be given with the conditions and precautions observed in using foxglove.

11. *Note on the Therapeutic action of Cerium.*—By J. Y. Simpson.—The salts of few metals were at present in our pharmacopœia, and Dr. S. saw no reason why many more might not be added to their number. He had recently drawn the attention of the profession to the salts of nickel, which as far as his observation went, presented much similiarity in action to those of iron and quinine, and seemed to be of use in cases of sick headache. He now proposed to read to the Society some very imperfect observations on the therapeutic action of some other metals; and first, as to cerium, which, given in the form of nitrate, and in one grain doses twice or thrice a day, appeared to act as a sedative tonic of considerable value, strongly resembling bismuth, and the salts of silver. He had employed it in the first instance in cases of general chronic intestinal eruption—a peculiar and intractable form of disease, for which arsenic and nitrate of silver were generally prescribed, and where these remedies had failed, cerium had been tried with marked advantage. In irritable dyspepsia, with gastrodynia and pyrosis, and in chronic vomiting, its exhibition was attended with satisfactory results; and in the vomiting which occurs during pregnancy prompt relief was afforded. It was a good tonic, and a useful substitute for the salts

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[1] Edin. Monthly Journal of Med. Science, 1850, xi. p. 310.

[2] Dispensatory, 1842, p. 401.

of silver, bismuth, and hydrocyanic acid. Dr. S. had not employed it much in convulsive diseases, as chorea and epilepsy, in which nitrate of silver was used, but the exhibition of the salts of cerium was certainly attended with this advantage, that it could be persevered in without any fear of discoloration of the skin. As far as his experiments with cadmium went, it bore much resemblance to the preparations of antimony, and excited diaphoresis and vomiting. Tellurium, besides its expense, was precluded from being used in practice by its disagreeable effects. Dr. S. mentioned the particulars of a case where a dose had been inadvertently given to a student of divinity, and had been followed by the evolution of such a persistent odour, that for the remainder of the session the patient had to sit apart from his fellow students.—*Monthly Journ. Med. Sci.* Dec. 1854.

12. *New method of introducing medicines into the system, more especially applicable to painful local nervous affections.*—Dr. ALEXANDER WOOD has been led to introduce solutions of morphia and Batley's sedative solution into the cellular tissue, as near as possible to the affected nerve, by means of the small perforating syringe, constructed by Mr. Ferguson of Giltspur Street, for injecting aneurisms with perchloride of iron. Dr. Wood narrated nine cases in which he had employed this method of treatment, in all with perfect safety, in some with complete, in others with partial success. As to the *modus operandi* of this method of treatment, he endeavoured to show, from the experiments of Muller and others, that the effect of the local application of opium to a nerve was to destroy its sensibility at the part, and that from this action of the drug the immediate cessation of the pain arose. He then pointed out the rapidity with which absorption appeared to take place from the cellular tissue, which seemed to account for the rapidity of the narcotic effect which a small dose of opium so introduced was found to produce. He also pointed out, that other medicines might be introduced in the same way.

Dr. W. T. Gairdner mentioned, that a patient in his wards in the hospital, had been injected the other day in the way recommended by Dr. Wood. The result was not decisive, as the complaint for which the man was under treatment, viz: lumbago, had been undergoing rapid amendment, and, indeed, the day after the operation, was nearly gone. The experiment, however, was attended with little suffering, and it was noted that some degree of giddiness was almost immediately produced.—*Monthly Journ. Med. Sci.*, Feb., 1855.

13. *The So-called Chloric Ether.*—M. DONOVAN makes some interesting remarks on this article in the *Dublin Med. Press* (Feb. 28, 1855).

"Within a few years," he remarks, "medical practitioners have been in the habit of prescribing what is commonly designated spirit of *chloric ether.* To the compounder of the prescription this name causes some embarrassment: accordingly, we find that sometimes Dutch-oil, sometimes perchloride of carbon, but more generally chloroform, is employed, under the impression that these are the representatives of chloric ether. What is the apothecary to do? He is called on to supply an article which absolutely does not exist—there is no such thing as chloric ether: much confusion, therefore, results; the patient receives no benefit; and the physician administers a medicine which he never intended, and of which he has no medical knowledge.

"It is true that in some treatises on chemistry we find the term chloric ether applied to a liquid which does not deserve that name, it not being an ether at all. Chemists, no doubt, are acquainted with a liquid properly called perchloric ether; but this were rather a hazardous article of materia medica, inasmuch as it detonates violently, either by heating or shaking, and often explodes spontaneously.

"When chlorine and alcohol, in certain proportions, are presented to each other's action, aldehyde is produced. With an increased ratio of chlorine, an ether in very minute quantity is certainly formed, but it is hydrochloric ether, formerly called muriatic ether, not chloric ether."

This ether is difficult to obtain, and is of no use in pharmacy, for at a lower temperature than that of summer, it assumes the form of vapour unless confined by strong pressure.

Perceiving that spirit of hydrochloric ether is becoming a favourite with medical practitioners, M. Donovan tried several simple methods of producing it, and succeeded by the following:—

"Equal measures of alcohol and liquid muriatic acid, both in as high a state of concentration as possible, were distilled by a cautiously regulated heat through a stoneware worm surrounded by snow, the liquor being received into a balloon refrigerated with a mixture of snow and salt. All the junctures were well secured as soon as the contents of the retort began to boil. Two-thirds of the original measure of the alcohol were drawn off. This liquid was poured into a retort containing a much larger quantity of dried carbonate of potash than was necessary for saturation, and the tubulature instantly closed; for if not instantly, the extricated carbonic acid would have carried off much ether. When one-fourth of the original measure of the alcohol had passed over, the distillation was discontinued. The excess of carbonate of potash retained the chief portion of the water present.

"In this case, when the acid liquor and carbonate of potash were presented to each other, an effervescence took place, because there was water in the former; but for this none would have occurred; and the acid would not have saturated the hydrochloric acid which the ethereal liquor contained.

"Another process, which afforded not only spirit of hydrochloric ether, but hydrochloric ether itself, was the following: A mixture of thirty-two ounces of strong alcohol, and sixteen of sulphuric acid, each by measure, was poured into a retort containing thirty-six ounces of well-dried common salt. The apparatus was arranged as before, and the distillation proceeded with. The first ten ounces of distilled liquor were highly acid. The retort and its contents being removed, a new one, almost filled with well-dried pearlash, was luted to the same apparatus: into this was poured the acid ethereal liquid, and the distillation was resumed. The first two ounces of the distilled liquor consisted of ether strongly impregnated with hydrochloric acid, notwithstanding the presence of so great an excess of alkali, the effect of the latter being merely to detain the water present. Scheele had observed an analogous phenomenon in the case of sulphuric ether (*Essays*, 301).

"This ether was immiscible with water, and burned with a white fuliginous flame—a characteristic of hydrochloric ether. Several modes of detaching the hydrochloric acid were resorted to, care being taken to avoid such means as would produce effervescence. The best mode seemed to be to add a small quantity of water, equal to about one quarter of the ethereal liquor; to agitate the mixture; and when the strata separated, to draw off the upper one with a suction tube. The ether was now entirely free from acidity; but its quantity was much reduced.

"The distillation of what remained in the retort being resumed, the ethereal liquor produced was very acid.

"I found that saturation with magnesia (not carbonate) answered every purpose: but as, on each addition of this, a slight elevation of temperature took place, which caused the expulsion of a little ether in vapour, it was necessary to immerse the bottle which contained the mixture in snow after each successive quantity. This neutralized liquor being redistilled, afforded a spirit of hydrochloric ether of a sweetish penetrating taste. To this was added the ether previously obtained.

"No more magnesia must be used than is necessary for saturation; for if more be present, violent concussions will occur towards the end of the distillation.

"The liquor thus produced contains a small quantity of alcohol; it is therefore *spirit of hydrochloric ether*, and is in a fit state for medical use. It is permanent at all ordinary temperatures. It mixes readily, and in all proportions with water, which pure hydrochloric ether does not. Its taste is pungent and penetrating, but much less disagreeable than sulphuric ether. Of its medicinal properties it is not my province to speak; but from its sensible qualities, I should suppose it to possess energy. I have some reason to suspect that it would act as an anæsthetic, and perhaps might have its advantages. The season was favourable for these experiments, they having been made during the late fall of snow."

14. *Chloroform and Ether combined as an anæsthetic.*—M. Robert, in his report on chloroform to the *Societé de Chirurgie*, recommended a mixture of equal parts of chloroform and ether as the best anæsthetic agent. M. Cellaries has subsequently published (*Gaz. Méd. de Montpellier*, 1853), the results of experiments made by him with the compound upon rabbits, etc.; and he reports very favourably as to its efficiency as an anæsthetic. The two fluids combine together, without the occurrence of any precipitate, and the odour of the compound is said to be far from disagreeable.—*Gaz. Méd. de Paris*, No. 96, 1854.

[This combination was first employed, we believe, in this country, and is preferred to either article alone by several of our practitioners.]

15. *New Hæmostatic Agent Invented by* M. Monsel.—M. Armand, Aide-Major of the 36th Regiment, in an article in the *Gazette Médicale de Paris* (December 30, 1854), states that M. Monsel was induced to undertake the analysis of the eau Pagliari. From his first trials, the reactions made evident the presence of the sulphate of alumina and potash, associated with an organic matter the odour of which resembled that of vanilla. M. Monsel then thought that, on treating the balsam of Peru—which, as is generally known, possesses a strong odour of vanilla—with the subcarbonate of soda, and by throwing the residue of the treatment into a solution of cubic alum, he could obtain an alum charged with a principle identical with that of the analyzed water. This having been verified, he determined to test by the same treatment the resin of the gum benzoin, and the balsam of tolu. The results being the same, he came to the conclusion that the unknown fluid consisted of benzoic acid dissolved in alum. Having formed an hæmostatic agent, in his opinion similar to the eau Pagliari, he proceeded to test its coagulating power experimentally.

The results of these experiments were satisfactory.

M. Monsel has also made another very efficacious hæmostatic, by adding ten grains of tannic acid, and a scruple of alum, deprived of its iron, to an ounce and a half of rose-water.

16. *New Broth for the Sick.*—By Justus Liebig. To prepare this broth, half a pound of the flesh of a recently killed animal (beef, or the flesh of a flowl) is chopped fine, and well mixed with a pound and an eighth of distilled water, to which four drops of pure muriatic acid, and from half to a drachm of common salt, have been added. After an hour, the whole is thrown on a common hair sieve, and the fluid is allowed to run off without pressure. The first portion, which is turbid, is poured back, until the fluid runs off quite clear. On to the fleshy residue in the sieve half a pound of distilled water is thrown in small portions. In this way a pound of fluid (cold extract of meat) is obtained, of a red colour, and an agreeable taste of broth. The sick are allowed to drink a cupful cold at pleasure. It must not be heated, as it then becomes turbid, and deposits a thick coagulum of animal albumen and hæmatin.

The sickness of a young female servant from typhus, in my house, gave occasion to this preparation. It was called forth by a remark of my medical attendant, that, in certain conditions of this disease, the greatest difficulty which presented itself to the physician lies in an imperfect digestion—a consequence of the condition of the intestines, and the difficulty of obtaining food suitable for digestion and the formation of blood. Generally, broth prepared by boiling is deficient in all those ingredients of meat which are necessary for the formation of the albumen of the blood, and the yolk of egg which is added is very poor in this substance, as it contains in the whole 82½ per cent. of water, and 17½ per cent. of egg-albumen, or a substance analogous to it, and whether this substance, in its nutritive qualities is equal to the albumen of flesh is, according to the investigations of Magendie, at least doubtful. Besides the flesh albumen, the new broth contains a certain quantity of hematin, and therein a large quantity of iron necessary for formation of blood corpuscles, and, lastly, the muriatic acid for its digestion. A great hinderance to the employment of this broth in summer is its changeableness in hot weather. It undergoes fermentation, as sugar with yeast, without giving a disagreeable odour. What substance causes this change it is very desirable to ascertain. On that account the flesh must be treated with very cold water in a cool place. Icewater and cooling with ice removes this difficulty. But, above all things, care must be observed that the flesh is used fresh, and not several days old. In the hospitals of Munich and in private practice this broth has been employed with great advantage.—*Annalen der Chemie* and *Annals of Pharmacy.*

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

17. *Plastic Bronchitis.*—Dr. T. B. Peacock, Assistant Physician to St. Thomas's Hospital, and Physician to the City of London Hospital for Diseases of the Chest, relates (*Med. Times & Gaz.*, Dec. 30, 1854) a case of plastic bronchitis, in a boy 11 years of age, an out-patient of St. Thomas's Hospital, and presents the following interesting remarks on this disease, which, though rare, is of sufficiently frequent occurrence to render a knowledge of its chief characteristics a matter of practical importance.

"During the last session of the Pathological Society, I prepared a report, since published in the *Transactions*, in which I collected the particulars of thirty-four cases of fibrinous expectoration, and deduced from them certain general inferences as to the circumstances under which it occurs. Since that report was drawn up, a memoir on the subject has appeared, by Dr. Thierfelder, of Leipsic, which contains the account of a case which had occurred to the author, and notices of five others, three of which are new to me. I have also seen the reports of cases by Gendrin and Caseaux; and my attention has been drawn, by Dr. O'Connor, to two interesting communications, containing several well-observed cases, by Dr. Banks and Dr. Gordon, published in the *Dublin Journal*, which, from the unavoidably hasty way in which the report for the Pathological Society was drawn up, had escaped my notice.

"The cases to which I have now alluded, together with those referred to in the report, amount to forty-eight in number; and it would probably not be difficult still further to increase the series. I find, however, that the inferences previously drawn so closely correspond with those which an analysis of the more numerous data establish, that there would be little advantage in endeavouring to obtain a wider basis for generalization.

"1. The *plastic bronchitis, bronchite pseudo-membraneuse*, or *bronchitis crouposa*, as the disease has been termed by different modern writers, is of more frequent occurrence in males than in females.

"2. While the affection is not limited to any period of life, but occurs both in the young, in persons of middle age, and in the old, it is most frequent between the ages of 20 and 50.

"3. It may attack persons who have enjoyed robust health, but generally occurs in those who have been previously suffering from some chronic pulmonary disease, or who have been exhausted by other debilitating causes.

"4. The affection is characterized by the ordinary phenomena of bronchitis, aggravated, however, by the difficulty in expectorating the solid material; and it may either be acute, rapidly terminating in recovery or in death; or chronic, the peculiar sputa continuing to be expectorated, at longer or shorter intervals, for weeks, months, or even years; or it may repeatedly recur on any exacerbation of the bronchitic symptoms.

"5. Hæmoptysis, at least to any considerable extent, is by no means a frequent or even a common symptom; but, on the contrary, the membranous material is most generally expectorated, either almost alone, or mixed with the